REMARKS

Claims 1-18 are pending in this application. Claim 2 is rejected under 35 U.S.C. §112 as being indefinite. Claims 1 and 2 are rejected under 35 U.S.C. §102(b) as being anticipated by Chang, U.S. Patent No. 6,016,216 A (hereinafter "Chang"). Claims 1-8 and 11-13 are rejected under 35 U.S.C. §102(b) as being anticipated by Cao, U.S. Patent No. 6,236,506 B1 (hereinafter "Cao"). Claims 2, 9, 10, and 14-18 are rejected under 35 U.S.C. §102(b) as being anticipated by Lu et al, U.S. Patent No. 6,154,581 A (hereinafter "Lu"). Reconsideration of the rejections is hereby solicited in view of the foregoing amendments and the following remarks.

Claim 2 has been amended to correct for indefiniteness. Accordingly, with regard to the rejection under 35 U.S.C. §112, claim 2 is believed to be in condition for allowance.

With regard to the rejection of claim 1 under U.S.C. §102(b) as being anticipated by Chang, claim 1 has been amended to highlight patentable aspects of the present invention that may not have been fully appreciated. The applicant respectfully submits that Chang does not appear to teach or otherwise suggest directing light beams in a *reverse* direction in optical pathways. Rather, Chang appears to merely teach directing two different light beams having separate emission points in a forward direction along optical pathways. See for example, Chang, FIG. 2, and column 4, lines 42-62. Consequently, Chang does not appear to teach the step of "directing the first optical beam portion in a forward direction in a first optical pathway, and directing the first optical beam portion in a reverse direction in a second optical pathway." Nor does Chang appear to teach "directing the second optical beam portion in a forward direction in the second optical pathway, and directing the second optical beam portion in a reverse direction in the first optical pathway." Furthermore, Chang does not appear to teach or suggest "splitting an optical beam emitted from an emission point to produce a first beam portion and a second beam portion" and "recombining the first. optical beam portion traveling in the reverse direction along the second optical pathway and the second optical beam portion traveling in the reverse direction along the first optical pathway into a processed optical beam directed back into the emission point" Thus, for the above reasons, applicant submits that amended claim 1 is patentably distinguishable from Chang and is in condition for allowance.

With regard to the rejection of claim 2 under U.S.C. §102(b) as being anticipated by Chang, claim 2 has been amended to highlight patentable aspects of the present invention that may not have been fully appreciated. The applicant respectfully submits that Chang does not teach or otherwise suggest the elements recited in claim 1. Specifically, Chang appears to merely teach uni-directional optical pathways conducting light in a forward direction. See for example, Chang, FIG. 2, and column 4, lines 42-62. Nowhere does Chang appear to describe an optical pathway for conducting light in both a forward and reverse direction. Consequently, Chang fails to teach or otherwise suggest "a first bi-directional pathway for conducting the first beam portion in a forward direction and the second beam portion in a reverse direction." Nor does Chang teach or suggest a "a second bi-directional pathway for conducting the second beam portion in forward direction and the first beam portion in a reverse direction" as recited in claim 1. In addition, Chang fails to teach or suggest "a beam splitter for splitting an optical beam emitted from an emission point to produce a first beam portion and a second beam portion and recombining respective portions of a split optical beam into a processed optical beam directed back into the emission point."

Furthermore, Chang does not appear to teach "a beam redirecting means for redirecting the first beam portion back along the second bi-directional pathway in the reverse direction and for redirecting the second beam portion back along the first bi-directional pathway in the reverse direction." In contrast, Chang merely appears to teach a beam redirecting means for redirecting light in the same direction along a different pathway. See for example, Chang, FIG. 2, and column 4, lines 42 -62. Thus, for the above reasons, applicant submits that amended claim 2 is patentably distinguishable from Chang and is in condition for allowance.

With regard to the rejection of claim 1 under U.S.C. §102(b) as being anticipated by Cao, claim 1 has been amended to highlight patentable aspects of the present invention that may not have been fully appreciated. The applicant respectfully submits that Cao does not teach or otherwise suggest the operational relationships recited in claim 1. Specifically, Cao appears to teach an optical circulator splitting an optical beam emitted from one emission point, e.g., port A in FIG. 5 of Cao, and conducting the resulting split beams in a forward direction along respective pathways. The split beams are then redirected and conducted along *different* respective pathways and recombined and directed into a *different* emission point, e.g. port D of FIG. 5 of Cao. See, for example Cao, FIGS. 3-6 and column 4 lines 50-67, to column 8 line 12.

Accordingly, Cao describes a method of optical circulation in which the split beams travel different paths and do not travel from an emission point and return to that same emission point. This is completely different than the method of the present invention. Consequently, Cao fails to teach or otherwise suggest "splitting an optical beam emitted from an emission point to produce a first beam portion and a second beam portion" and "recombining the first optical beam portion traveling in the reverse direction along the second optical pathway and the second optical beam portion traveling in the reverse direction along the first optical pathway into a processed optical beam directed back into the emission point so that each optical beam portion traverses the same path as the other optical beam portion from the emission point back into the emission point."

Nor does Cao teach or suggest "directing the first optical beam portion in a forward direction in a first optical pathway, and redirecting the first optical beam portion in a reverse direction in a second optical pathway" or "directing the second optical beam portion in a forward direction in the second optical pathway, and redirecting the second optical beam portion in a reverse direction in the first optical pathway." Therefore, for the above reasons, applicant submits that amended claim 1 is patentably distinguishable from Cao and is in condition for allowance.

With regard to the rejection of claim 2 under U.S.C. §102(b) as being anticipated by Cao, claim 2 has been amended to highlight patentable aspects of the present invention that may not have been fully appreciated. The applicant respectfully submits that Cao does not teach or otherwise suggest the elements recited in claim 2. Specifically, Cao appears to teach an optical circulator having a beam splitter splitting an optical beam emitted from one emission point, e.g., port A in FIG. 5 of Cao, and respective pathways conducting the split beams in a forward direction along the respective pathways. The split beams are then redirected and conducted along *different* respective pathways and recombined in the beam splitter and directed into a *different* emission point, e.g. port D of FIG. 5 of Cao. See, for example Cao, FIGS. 3-6 and column 4 lines 50-67, to column 8 line 12. Accordingly, Cao describes an optical circulator in which the split beams travel different paths and do not travel from an emission point and return to that same emission point. The beam splitter and bidirectional pathways described in Cao are completely different than the beam splitter and bidirectional pathways of the present invention. Consequently, Cao fails to teach or otherwise suggest a "beam splitter for splitting an optical beam emitted from an emission point to produce a first beam portion and a second beam portion and recombining respective portions of a split optical beam into a processed optical beam directed back into the emission point." Nor does Cao teach or suggest a "first bi-directional pathway for conducting the first beam portion in a forward direction and the second beam portion in a reverse direction" and a "second bi-directional pathway for conducting the second beam portion in forward direction and the first beam portion in a reverse direction." Thus, for the above reasons, applicant submits that amended claim 2 is patentably distinguishable from Chang and is in condition for allowance. Claims 3-8 and 11-13 depend from claim 2, now believed to be in condition for allowance, and include all the structural and/or operational relationships of claim 1. Consequently, Cao also fails to teach or suggest the elements of claims 3-8 and 11-13. Therefore, claims 3-8 and 11-13 are submitted to be in condition for allowance.

With regard to the rejection of claim 2 under U.S.C. §102(b) as being anticipated by Lu, claim 2 has been amended to highlight patentable aspects of the present invention that may not have been fully appreciated. The applicant respectfully submits that Lu does not teach or otherwise suggest the elements recited in claim 2. Specifically, Lu appears to teach an optical circulator having a beam splitter splitting an optical beam emitted from one emission point, e.g., 440 in FIG. 5A of Lu, and respective pathways conducting the split beams in a forward direction along the respective pathways. The split beams are then redirected and conducted along *different* respective pathways and recombined in the beam splitter and directed into a *different* emission point, e.g. 460 of FIG. 5B of Lu. See, for example Lu, FIGS. 4 and 5, and column 9, line 48 to column 11, line 10. The side view of FIG. 4B of Lu shows the return beams traveling along different pathways and being directed into a different emission point. Accordingly, Lu describes an optical circulator in which the split beams travel different paths and do not travel from an emission point and return to that same emission point. The beam splitter and pathways described in Lu are completely different than the beam splitter and bidirectional pathways of the present invention. Consequently, Lu fails to teach or otherwise suggest a "beam splitter for splitting an optical beam emitted from an emission point to produce a first beam portion and a second beam portion and recombining respective portions of a split optical beam into a processed optical beam directed back into the emission point." Nor does Lu teach or suggest a "first bi-directional pathway for conducting the first beam portion in a forward direction and the second beam portion in a reverse direction" and a "second bi-directional pathway for conducting the second beam portion in forward direction and the first beam portion in a reverse direction." Thus, for the above reasons, applicant submits that amended claim 2 is patentably distinguishable from Lu and is in condition for allowance.

Claim 9 depends from claim 2 and incorporates all of the elements of claims 2. As described above with respect to claim 2, Lu fails as an anticipatory reference. Consequently, Lu fails to teach or suggest the apparatus recited by claims 2 and 9. Furthermore, applicants respectfully submit that, after a careful review, nowhere does Lu appear to mention or describe the use of an acousto-optical device for the birefringement crystal 422 shown in FIG. 4A of Lu, or any other device described in Lu. For all the above reasons, Lu fails to teach or suggest the elements of claim 9. Therefore, claim 9 is believed to be in condition for allowance.

Claim 10 depends from claims 2 and 9 and incorporates all of the elements of claims 2 and 9. As described above with respect to claim 2, Lu fails as an anticipatory reference. Consequently, Lu fails to teach or suggest the apparatus recited by claims 2, 9, and 10. Furthermore, applicants respectfully submit that nowhere does Lu appear to mention or describe the use of an acousto-optical device for the birefringement crystal 422 shown in FIG. 4A of Lu. For all the above reasons, Lu fails to teach or suggest the elements of claim 9. Therefore claim 9 is believed to be in condition for allowance.

Independent claim 14 stands rejected under under U.S.C. §102(b) as being anticipated by Lu. Lu appears to teach an optical circulator conducting split portions of an optical beam in a forward direction along respective optical pathways and then redirecting and conducting the split portions along *different* respective pathways. See, for example Lu, FIGS. 4 and 5, and column 9, line 48 to column 11, line 10. The side view of FIG. 4B of Lu shows the redirected split portions returning along different pathways than the pathways traveled in the forward direction. Accordingly, Lu describes an optical circulator in which the split beams travel different paths after being redirected. The pathways described in Lu are completely different than the bidirectional pathways of the present invention. Consequently, Lu fails to teach or otherwise suggest a "first bi-directional pathway for conducting at least a portion of the first beam and a second bi-directional pathway for conducting at least a portion of the second beam; and [for conducting] a portion of the first beam back along the second bi-directional pathway and for redirecting the at least a portion of the second beam back along the first bi-directional pathway."

In addition, applicant respectfully submits that nowhere does Lu appear to mention or describe the use of an acousto-optical device for the birefringement crystal 422 shown in FIG. 4A of Lu, nor any other device mentioned in Lu. Consequently, Lu fails to teach or suggest an "acousto-optical device comprising a first bi-directional pathway for conducting at least a portion of the first beam and a second bi-directional pathway for conducting at least a portion of the second beam." For the above reasons, claim 14 is believed to be in condition for allowance.

Claims 15-18 depend from claim 14, now believed to be in condition for allowance, and include all the elements of claim 14. For at least the reasons described above with regard to the rejection of clam 14, applicant respectfully submit that Lu fails to teach or suggest the elements of claims 15-18. Therefore, claims 15-18 are submitted to be in condition for allowance.

Reconsideration of the application and allowance of claims 1-18 are respectfully requested. Under 37 CFR 1.34, Attorney signing below asserts that he is authorized to represent the applicants.

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CERTIFICATE OF TRANSMISSION

I HEREBY CERTIFY that this Amendment is being FAXED to: U.S. Patent Office at **703-872-9306** on this 19th day of April, 2005.

W. David Sartor